

CAM Topic Maps toolbox user guide

1. Getting started

1.1. Prerequisites

This user guide assumes you:

- Are familiar with using CAM¹
- Broadly understand how the Topic Maps standard is used²

1.2. Toolbox installation

1. Get the Topic Maps toolbox package³
2. Install the Topic Maps palettes (unpack the zip file and move the *TopicMaps-Simple* and *TopicMaps-Strict* folders to the *palette* folder of your CAM directory)
3. Install the Topic Maps modules (copy the .jar files into the *modules* folder of your CAM directory)

1.3. Versions

Workbook	TopicMaps-Simple workbook	TopicMaps-Strict workbook
Overview	A simple, visual Topic map where elements have a limited number of properties.	A complete Topic map that can be analysed in a number of ways.
Advantages	Does not require you to understand advanced Topic Maps concepts.	Greater degree of analysis possible.
Recommended use	You are recommended to use this version in situations where analysis is not required and few people will browse or modify the created Topic map (this version does not attempt to formally identify subjects).	You are recommended to use this version if you may wish to use another application to interact with the Topic map, if other people may view your Topic map, or if in-depth analysis is required.

Table 1: A comparison of Topic Maps versions

1 A user guide for CAM can be found at <http://www-edc.eng.cam.ac.uk/cam/documentation/>

2 The introduction section of the accompanying report (Topic Maps for the Cambridge Advanced Modeller) contains an overview of the Topic Maps standard. Alternative introductory documents can be found on the Ontopia website <http://www.ontopia.net/section.jsp?id=tm-intro>

3 The package can be downloaded from <https://www-edc.eng.cam.ac.uk/cam/documentation/Toolboxes>

The Topic Maps toolbox allows you to create two new types of workbook (Table 1).

1.4. Creation

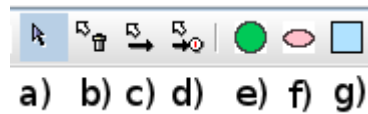


Figure 1: The Topic Maps palette (the palette element order may differ to that shown in the figure). Icons a-d are defined by CAM, and icons e-g are defined by the Topic Maps palette.

The palette looks the same for both versions of Topic Maps workbook (Figure 1). Topics (icon f), Associations (icon g) and Occurrences (icon e) are all palette elements. You can create, and interact with elements as normal in CAM.

This toolbox defines two connectors (created using the connection tool, icon c):

1. Association role connectors – These connect Topics to Associations, and Associations to Topics. They represent Association role items, and have Association role properties.
2. Occurrence connectors – These connect Occurrences to Topics, and Topics to Occurrences. They have no properties and represent the parent relation from an Occurrence to a Topic.

Both connectors are bi-directional and have no arrow-heads. They both have Label properties, which should not be used as they will be removed in a later version of the toolbox.

2. Reference

2.1. Palette elements and shortcut elements

CAM allows shortcut elements to be created by right-clicking an existing palette element and selecting *Create shortcut*. This toolbox treats shortcut elements differently, depending on the type of palette element they are a shortcut to.

Topic and Association shortcut elements are treated as extensions of the original palette element. For example, connecting an Occurrence palette element to a Topic palette element would be interpreted in an identical manner to the Occurrence being connected to a shortcut of the Topic palette element. Topic and Association shortcuts can be used to create Associations spanning multiple worksheets, without requiring many hyperlink Association role connections.

Occurrence palette and shortcut elements are treated rather differently, however. Because an

Occurrence item has a single Topic item as its parent, an Occurrence palette element can only meaningfully be connected to a single Topic element (palette or shortcut). Therefore, situations in which an Occurrence element is connected to multiple Topic elements⁴, are interpreted as each of the Topics having a separate Occurrence with the same properties as those in the Occurrence element. Consider a Topic Maps workbook containing an Occurrence palette element, with value *Occurrence1* and type *OccurrenceType*, connected to two Topic palette elements, *Topic1* and *Topic2*. This would be interpreted as two Topics, *Topic1* and *Topic2*, each of which has an Occurrence with value *Occurrence1* and type *OccurrenceType*. Connecting Occurrence palette elements to multiple Topic elements, or using Occurrence shortcut elements, can lead to confusion – you are recommended to avoid doing either.

2.2. Properties

Various properties are used in the Topic Maps toolbox that don't occur in other models. These properties are:

- A Topic combo box (Figure 2a) – A variant of CAM's usual combo box property that allows you to select a Topic from an alphabetically ordered list of the Topics currently in the Topic map. You should use this in the same way as CAM's standard combo box property, but be mindful that the available options will change as Topics are created and deleted. The selection is of a specific Topic element, so changing the name of that Topic, or, indeed, altering the selected Topic in any way will not affect which Topic is selected. Beware you cannot differentiate between identically named Topics in the list – they appear as duplicate entries. Type and Reifier properties use this combo box.
- An editable combo box (Figure 2b) – Another variation of CAM's combo box, which allows you to either select an entry from a list of options, or add a new entry to the list. Datatype properties use this combo box.
- A set of entries (Figure 2c) – A list of items controlled using a combo box or text field (the editor). Clicking the *Add* button adds the contents of the editor to the start of the list. You can modify or remove entries by selecting them in the list and using the right-click menu, or the *Delete* or *Backspace* keys. Duplicate entries are not permitted. Item identifiers, Subject identifiers and Subject locators use this property with a text field editor, Scope uses this property with a Topic combo box editor.

⁴ Situations where the total number of connections from an Occurrence palette element, or a shortcut thereof, is greater than one

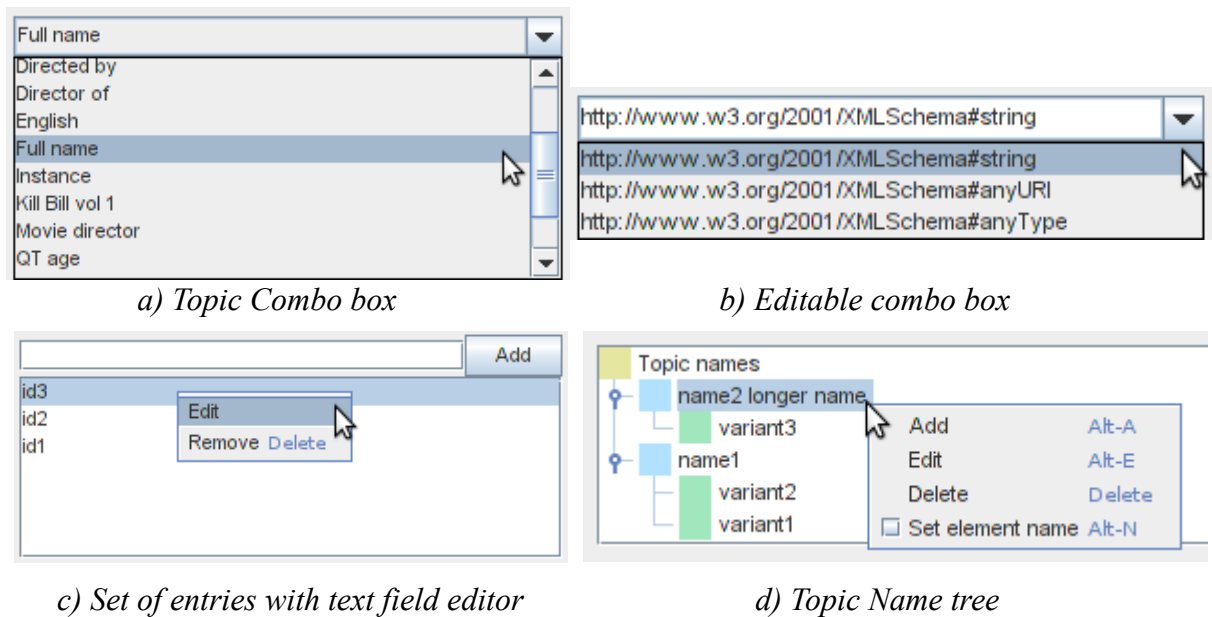


Figure 2: Topic Map properties

- A Topic name tree (Figure 2d) – A hierarchy of Topic names (first level in the tree) and Variants (second level in the tree). Edit Topic name and Variant properties by double-clicking an entry, or by selecting an entry and using the right-click menu or *Alt+E* shortcut. Add new entries by using the right-click menu, or by pressing *Alt+A*. Delete entries by selecting them and using the right-click menu, or the *Delete* or *Backspace* keys. Deleting a Topic name will delete all its Variants. You may select one item in the tree to be the display name of the Topic, using the right-click menu option, or pressing *Alt+N*. Topic name properties use this tree.

In the strict Topic Maps version, the Topic map itself has properties. These properties can be modified using the *Tools* → *Topic map properties* menu option.

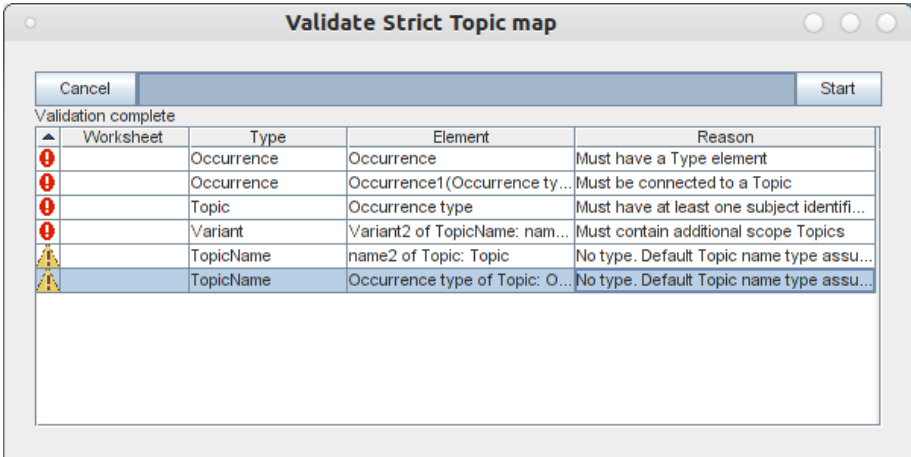
2.3. Tools

2.3.1. Conversion between versions

If, after creating a Topic map, you regret your choice of workbook version, you may change versions using the appropriate conversion menu option in the *Tools* menu. The two conversion menu options use wizards to guide you through the conversion process. In both cases, a new workbook is created and added to the current CAM workspace. The new workbook is the converted workbook.

2.3.2. Validation (strict Topic Maps only)

When creating a strict Topic map, you should ensure it conforms to the Topic Maps standard⁵. This allows it to be Exported (see below) and ensures there is no confusion when it is browsed. Use the validation menu option (*Tools* → *Validate Topic map*) to determine the changes required to make the Topic map valid. After running the validation algorithm (by clicking the *Start* button), the table (in Figure 3) is populated with a list of the Topic map's validity issues. Double-clicking cells in the table focusses CAM on the offending item. Double-clicking an entry in the Worksheet column causes CAM to change its view to display the worksheet of the offending item. Double-clicking an entry in any other column focusses CAM on the offending element. If the Reason column references another element involved in the offence (e.g. if an element is a duplicate of another element), double-clicking the Reason entry will focus CAM on the other involved element. Each of the entries in the table has a severity grade – red circle indicates error, yellow triangle warning, and blue circle information. Only the errors need to be fixed.



Worksheet	Type	Element	Reason
❗	Occurrence	Occurrence	Must have a Type element
❗	Occurrence	Occurrence1(Occurrence ty...	Must be connected to a Topic
❗	Topic	Occurrence type	Must have at least one subject identifi...
❗	Variant	Variant2 of TopicName: nam...	Must contain additional scope Topics
⚠	TopicName	name2 of Topic: Topic	No type. Default Topic name type assu...
⚠	TopicName	Occurrence type of Topic: O...	No type. Default Topic name type assu...

Figure 3: Screenshot of the validation dialog

2.3.3. Export (strict Topic Maps only)

XTM 2.0 is an XML syntax for Topic Maps that allows Topic Maps applications to be used interchangeably. This tool makes it possible to create a Topic map on CAM, export it to an XTM 2.0 file, and use it with another Topic Maps application. To export a strict Topic map, select the *Tools* → *Export Topic map to XTM* menu option. Choose the save location and click *Save*. Exporting a large Topic map might take several minutes.

⁵ ISO 13250-2: Topic Maps data model (available at <http://www.isotopicmaps.org/sam/sam-model/>)

2.3.4. Import (strict Topic Maps only)

The import operation is the reverse of Export. A Topic map defined in an XTM 2.0 document is loaded into a CAM worksheet, and that worksheet added to the current workbook. To import a strict Topic map, select the *Tools* → *Import Topic map from XTM* menu option, locate the XTM document, and click *Import*. Importing a large Topic map might take several minutes.

2.3.5. Merge (strict Topic Maps only)

Merge is an operation defined in the Topic Maps data model standard, where duplicate items in a Topic map are detected and merged to reduce redundancy. To run the merge operation, select the *Tools* → *Merge Topic map* menu option, which opens a dialog window (Figure 4).

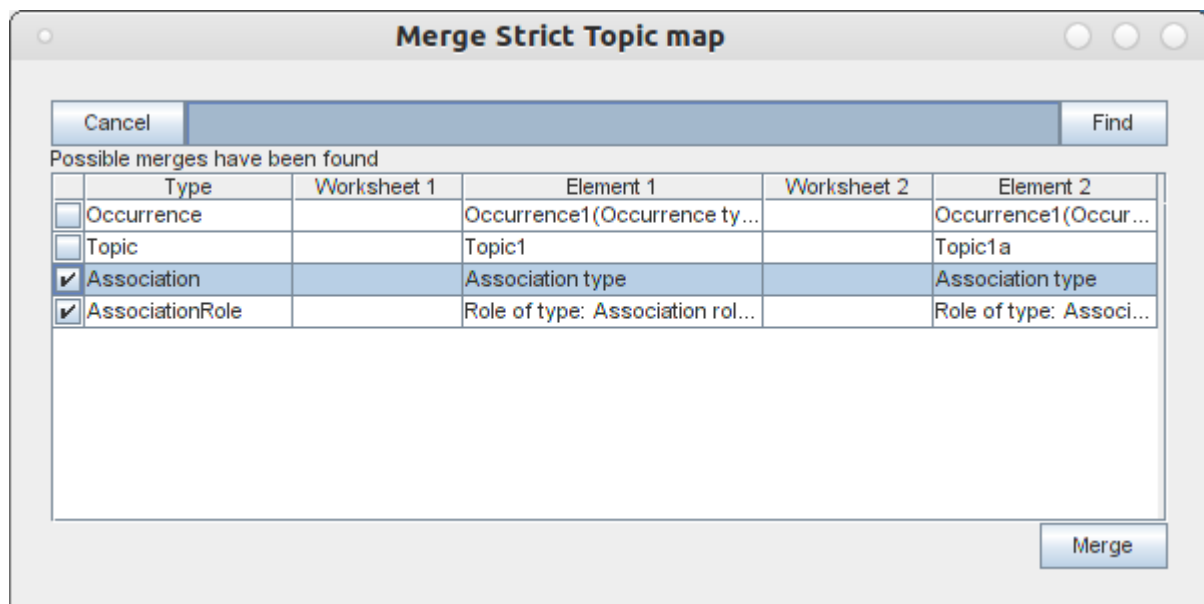


Figure 4: Merge operation dialog window

Operation:

1. Find the possible merges by clicking the *Find* button,
2. Select the desired merges to perform (by double clicking checkboxes at the left of the rows, or by highlighting rows and using the right-click menu),
3. Perform the selected merges by clicking the *Merge* button.

Double clicking cells in the *Element 1* or *Element 2* column focusses CAM on the palette element represented by that cell. Note: the Topic map workbook should not be modified between clicking the *Find* and *Merge* buttons. If the Topic map is modified after clicking

Find, the duplicates need to re-found by clicking *Find* again.

2.4. Type Topics

This toolbox treats Type Topics differently to many other Topic Maps applications. A Type Topic is any Topic that is the Type of another element (for example, the Topic referred to by the Type property of an Occurrence would be classified as a Type Topic). Many Topic Maps applications differentiate Type Topics from other Topics. This toolbox does not; Type Topics are treated in an identical manner to other Topics. You may, however, wish to separate Type Topics from other Topics by creating them on a separate worksheet.

2.5. Topic subjects (strict Topic Maps only)

You should attempt to unambiguously identify a Topic's subject. This is often done by referencing a subject indicator (i.e. setting the Topic's Subject identifier property to the Subject indicator's URI). A subject indicator ideally should be the minimum amount of information required to uniquely identify a subject. Published Subject Indicators (PSIs) are designed specifically for this purpose. Sadly, however, there are no large scale PSIs in existence. If you wish to create a correct Topic Map in the strictest sense, you should consider creating your own PSIs. In the majority of situations, however, Wikipedia articles are reasonable choices for subject indicators.

2.6. Datatype properties (strict Topic Maps only)

Occurrences and Variants have Datatype properties. Internationalized Resource Identifier Datatypes⁶ (“<http://www.w3.org/2001/XMLSchema#anyURI>”) state the Value property of the Occurrence or Variant is an IRI referring to the subject identifier that is the Variant name or the Occurrence information resource. The Value of any Occurrence or Variant, whose Datatype is not the IRI Datatype, is interpreted as a string that, after appropriate formatting, is the Variant name or Occurrence information resource. For example, if the Datatype of a Variant is the XML Datatype “<http://www.w3.org/2001/XMLSchema#anyType>”, then the string in the Value property is interpreted as an XML string, and the appropriate character conversions occur (e.g. *&* is converted to *&*).

2.7. Type-instance relation

A type-instance relation states one Topic is an instance of another Topic. For example, the

⁶ Internationalized Resource Identifier (IRI) is a generalization of URI to include characters from the Universal Character Set,

Topic Great Britain might be an instance of the Topic Country. This can be represented in a Topic map using an Association, following the procedure defined in the Topic Maps standard⁷.

2.8. Default Topic Names (strict Topic Maps only)

Often Topic names do not have a specific Type. In such cases, a default Type may be used by setting the Topic name Type to a Topic whose Subject identifier contains the URI:

“<http://psi.topicmaps.org/iso13250/model/topic-name>”. Any Topic names without a specified Type are assumed to have the default Type.

⁷ Section 7.2 of ISO 13250-2 (available at <http://www.isotopicmaps.org/sam/sam-model/#sect-types>)